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Publication date:
2016

Document Version
Publisher's PDF, also known as Version of record

Angle resolved performance measurements on PV glass and modules

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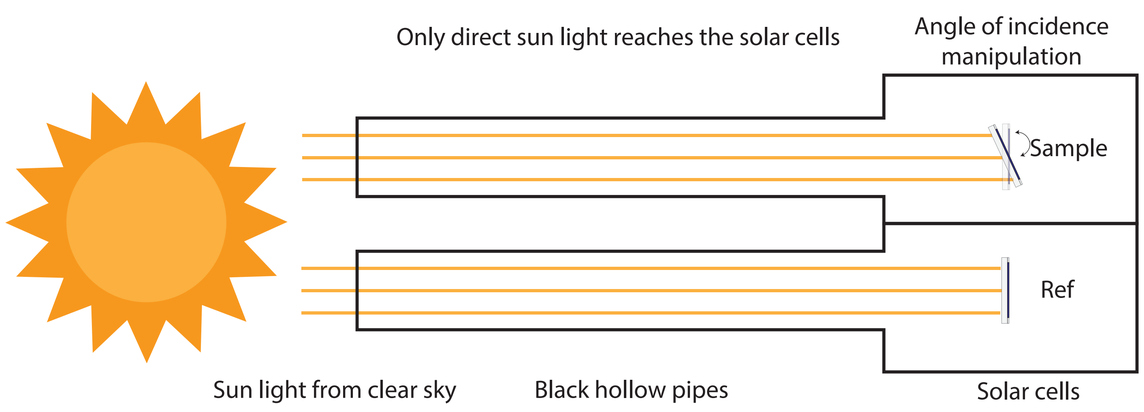
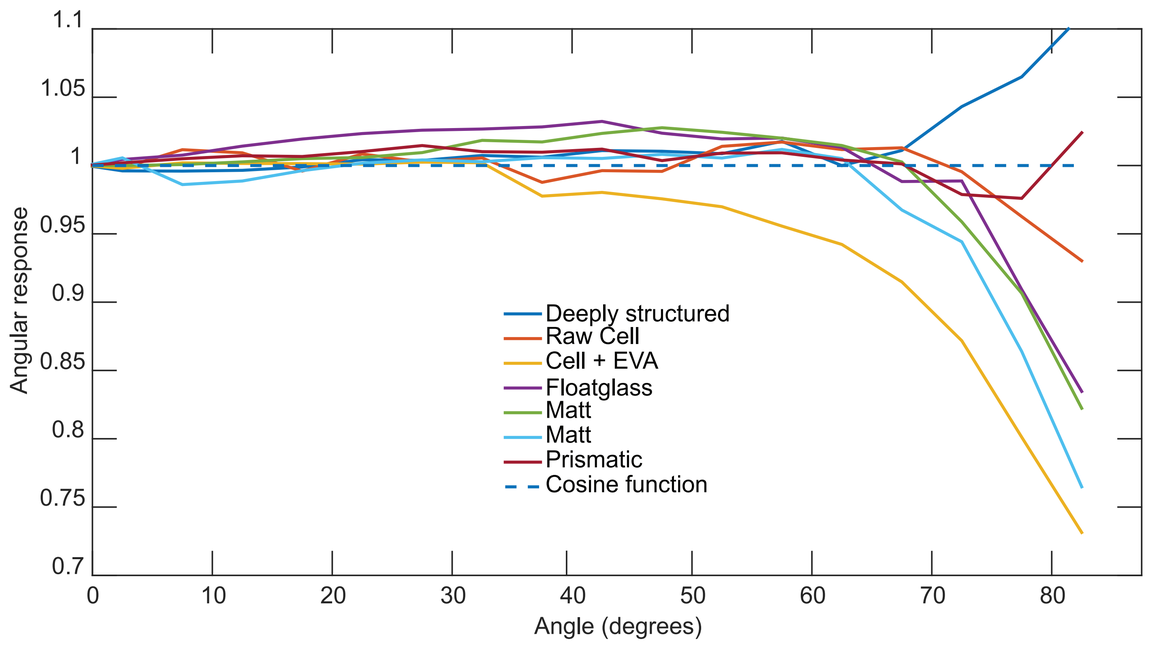
Motivation

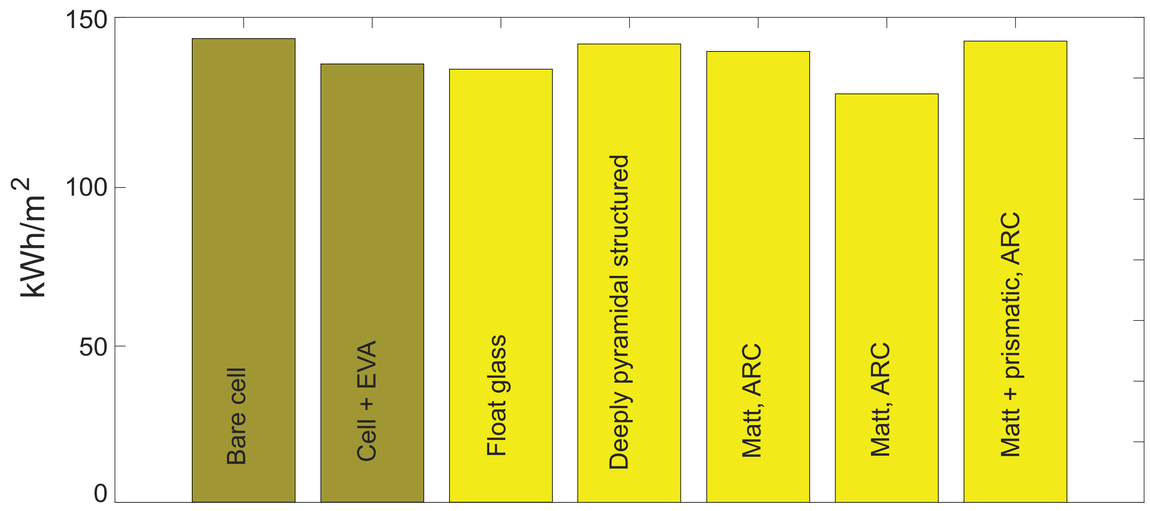
PV balcony fences are an example of PV application where odd angles of incidence are pronounced. The angular performance of the PV cover glass has a crucial impact on the energy output. We have characterized the angular response on a range of glasses with different AR properties.



Depiction of setup for outdoor measurments as viewed from above. Two pipes leads direct sun light into boxes containing the test sample and a reference sample respectively. The test sample rotates as the angular performance is measured.



Short circuit current measurements. Angular response is obtained by normalizing with respect to normal incidence and reference to the cosine function.



Estimation of annual effective irradiance south faced balcony in Roskilde, Denmark. The results are derived from a simple model based on irradiance data obtained from PVgis folded with the angular response curves.

Conclusion

Proper assessment of solar glass for PV balcony fences requires knowledge of the angular properties of the optical layers. Here solar glass have been investigated. A difference of 13 % between annual yield of the best and worst performing solar glass is found.

Outlook

Outdoor measurements introduce additional errors. Future work will include improvement of the experimental setup, while still keeping the actual sun as light source.

This research is funded by the Danish Energy Agency within the EUDP programme with the project journal number 64014-0185 “PV BALCONY FENCE – a highly esthetic cost efficient PV integrated balcony”.

Energiteknologisk udvikling og demonstration